Science & Technical Support Section's
SciFYI
King County
Department of Natural Resources and Parks
Water and Land Resources Division
A science section digest of current environmental issues in King County
November 2013 Article 1311-2

What rains on Vashon doesn't always stay on Vashon!

By Sevin Bilir and Eric Ferguson

The King County Science and Technical Support Section has been supporting a monitoring program of measuring precipitation, stream flow and groundwater on Vashon-Maury Island for a number of years in an effort to better understand the water resources on the Island.

The County works in conjunction with the Vashon-Maury Island Groundwater Protection Committee to implement the recommendations of the Ground Water Management Plan and address current local groundwater issues. This Committee represents many local interests, such as private and commercial well owners, businesses and tribal nations and serves the Island's community and advises the County and others on groundwater related actions and activities.

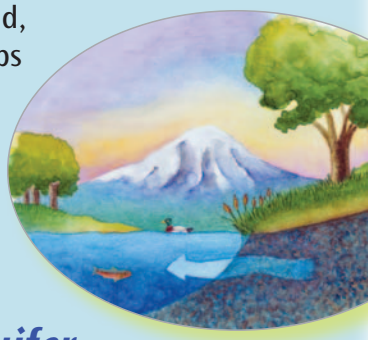
The County's Science and Technical Support Section has recently prepared a historical review of the water resources on Vashon-Maury Island, including a review of climate, marine water, surface water and groundwater data. This report is forthcoming to the public and is referenced at the end of this article.

Thanks to a successful community outreach and education program, Islanders know more about their water resources and the impacts that may reduce the availability for future use on Vashon-Maury Island. Photo: David Tiemann.

Aqui-what?

All drinking water sources on Vashon-Maury Island are supplied by rainfall. Rain soaks into the soil and is stored in the underlying sediment or rock. Aquifers are layers of sediment or rock that can hold water, much like a sponge that can still be wet after it has been squeezed. The groundwater in an aquifer is hidden from our view, but we see signs of groundwater, for example, in the form of springs along hillslopes and beaches where water can be seen flowing out of sands or gravels.

Water in geologic layers can leave the Island by flowing off the land, from springs and seeps on hillslopes, and from aquifers that discharge water to Puget Sound.



Living on a sole source aquifer

The Island was named a sole source aquifer in 1994 by the U.S. Environmental Protection Agency (EPA) and an Island Sole Source Aquifer by the County in 2005. The EPA defines a sole source aquifer as one that supplies half or more of the drinking water used in the area above the aquifer. These areas can have no other option for a drinking water source which could physically, legally, and economically supply all those who depend upon the aquifer for drinking water.

Impacts to water quality

Surface water and groundwater quality can be impacted naturally or as a result of human activity, such as construction activities, improper household waste disposal, fertilizer and pesticide use and faulty septic systems. Runoff (water flowing over the land surface) may pick up pollutants from wildlife and soils. Water sources that are closer to the ground surface are more vulnerable to contamination than those such as deep groundwater wells. Because over 50 percent of the Islanders obtain their water from water sources such as springs, surface water and groundwater that are close to the ground surface, it is important to monitor ongoing activities and water quality.

Yearly sampling and review of the health, types and number of bugs living in Judd Creek is key for evaluating and comparing stream health. Photo: Jo Wilhelm.

Surface water

Many of the creeks are fish-bearing and lead to Puget Sound. Studies have shown that the overall condition of surface water is improving as measured by the stream water quality index. Also, annual measurements bugs living in the streams show variability with some sampling locations improving and some worsening.

Stream temperatures in various creeks typically met the state criteria for good water quality status. Annual measurements of the magnitude of low flows and how often and how long high stream flows last indicate that responses are as expected with increases during wet years and decreases during dry years.

Groundwater

The groundwater water quality is good overall. Although nitrate concentrations showed increases at different times since 1967, recent testing indicated that most groundwater samples had no change in nitrate while some had increases and some had decreases. With the exception of arsenic above the EPA drinking water standard in a few wells, there were no exceedances for all other parameters tested. Wells with arsenic exceedances have deeper water-bearing zones that appear to have naturally occurring arsenic. Required water quality testing for public water systems, as sent to Washington State Department of Health, also reported no exceedances.

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How much water are we using?

The major use of water on the Island is for municipal and domestic purposes; lesser uses are for agricultural and commercial purposes. Based on a set group of volunteer permit exempt well owners, the measured average consumption of groundwater was around 103 to120 gallons per day (gpd). Public water systems reported an average daily use of about 100 to 200 gpd. Although Islanders have varying patterns of usage, it is common for increases in usage to occur during June through October.

Projections of population growth have been reported at 100 people per year and water demands increasing by 10 percent each year. Recent water use and demand modeling indicated that with respect to population growth and water use projections, lowering of water levels near larger public water system wells was noticeable.

Future challenges

A changing climate in the environment and within politics for the local, state and federal administrations are a challenge for any area where water resources are of interest. Maintaining a close relationship with residents and stakeholders under a reduced budget is a challenge and recent evidence shows that with reduction in volunteerism on Vashon-Maury Island, water resources data that may help with understanding the impacts on where water is available and where water is impacted are not being collected. Keeping the public educated and interested enough to engage in water resource activities is dependent on funding and a challenge to benefit from the knowledge gained from reduced or defunct programs.

Report Citations and Sources

- King County. 2013. Vashon-Maury Island Water Resources – A Retrospective of Contributions & Highlights–DRAFT. Prepared by King County Department of Natural Resources and Parks, Water and Land Resources Division, Science and Technical Support Section. Seattle, Washington.

- For more on the Groundwater Program on Vashon-Maury Island, go to http://www.kingcounty.gov/environment/waterandland/groundwater.aspx

Contributors to King County's Sci FYI

Sevin Bilir

Sevin is a hydrogeologist in the King County Science and Technical Support Section on projects in need of groundwater expertise. Sevin is a licensed hydrogeologist in Washington and California, with 19 years of experience. Her current work focuses on reporting the KingSTAT Environmental Indicators and developing a 3D hydrogeologic computer model of the Cedar Hills Regional Landfill.

Eric Ferguson

Eric is a hydrogeologist who has been with the King County Science and Technical Support Section for 14 years. He works for internal clients, such as the Wastewater Treatment Division, Solid Waste Division, and Water and Land Resources Division on projects in need of groundwater expertise. He currently works on Vashon sustainability monitoring and other water resources projects.

Published by:

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Science and Technical Support Section

Section Manager: Dave White

Newsletter Coordinator: Larry Jones

Editor: Doug Williams

Designer: Laurel Preston

Web Design/Production: Fred Bentler

Available on the Web at:
http://www.kingcounty.gov/environment/wlr/science-section/sci-fyi-newsletter.aspx

Send questions, comments and future story ideas to:

Kate O'Laughlin - kate.olaughlin@kingcounty.gov, 206-477-4789

Jim Simmonds - jim.simmonds@kingcounty.gov, 206-477-4825

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